With effect from the Academic Year 2024-25

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

ACCREDITED BY NAAC WITH 'A++' GRADE

Ibrahimbagh, Hyderabad-31

Approved by A.I.C.T.E., New Delhi and

Affiliated to Osmania University, Hyderabad-07

Sponsored

by

VASAVI ACADEMY OF EDUCATION

Hyderabad

SCHEME OF INSTRUCTION AND SYLLABI UNDER CBCS FOR M.Tech. (CSE) III to IV Semesters (For the batch admitted in 2023-24) (R-23

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Phones: +91-40-23146020, 23146021

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Institute Vision

Striving for a symbiosis of technological excellence and human values

Institute Mission

To arm young brains with competitive technology and nurture holistic development of the individuals for a better tomorrow

Department Vision

To be a center for academic excellence in the field of Computer Science and Engineering education to enable graduates to be ethical and competent professionals

Department Mission

To enable students to develop logic and problem solving approach that will help build their careers in the innovative field of computing and provide creative solutions for the benefit of society.

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M.Tech (CSE) Program Educational Objectives (PEO's) Graduates should be able to utilize the knowledge gained from their academic program to:	
PEO I	To provide students with the in depth knowledge in the area of Computer Science and Engineering to enable them to analyze and solve complex engineering problems.
PEO II	To provide the required knowledge to the students and prepare them to pursue research in the area of Computer Science and Engineering.
PEO III	To inculcate effective communication, teamwork and leadership skills and demonstrate an ability to relate engineering issues to social context.
PEO IV	To impart professional, ethical and social attitude and demonstrate the ability towards reflective learning needed for a successful career.

M.TECH. (CSE) PROGRAM OUTCOMES (PO's) **Engineering Graduates will be able to:**	
PO1	An ability to independently carry out research / investigation and development work to solve practical problems.
PO2	An ability to write and present a substantial technical report / document.
PO3	An ability to demonstrate a degree of mastery in the area of Computer Science & Engineering.
PO4	An ability to apply appropriate techniques and modern engineering tools in the design and development of solutions for complex Computer Science & Engineering problems.
PO5	An ability to apply engineering and management principles as a member and leader in a team, to manage projects in a multidisciplinary environment with lifelong learning capabilities.

M.Tech. (CSE) PROGRAM SPECIFIC OUTCOMES (PSO's)	
PSO I	Graduates will be able to design efficient algorithms and develop solutions for real world problems.
PSO II	Graduates will possess knowledge in specialized areas of computer science and Engineering.
PSO III	Graduates will be able to learn advanced technologies towards higher education and Research and Development (R&D).

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
SCHEME OF INSTRUCTION AND EXAMINATION (R-23)
M.TECH. – CSE : THIRD SEMESTER AY 2024 - 2025

M.TECH (CSE) III Semester								
Course Code	Name of the Course	Scheme of Instruction			Scheme of Examination			
		Hours per Week			Duration in Hrs	Maximum Marks		Credits
		L	T	P		SEE	CIE	
THEORY								
PI23PE3XXCS	Professional Elective – IV	3	-	-	3	60	40	3
PI23PE3XXCS	Professional Elective -V	3	-	-	3	60	40	3
PRACTICALS								
PI23PW319CS	Dissertation - Phase-I / Industrial Project	-	-	20	-	-	100	10
	TOTAL	**6**	**-**	**20**	**-**	**120**	**180**	**16**
	GRAND TOTAL	**26**				**300**		

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IBRAHIMBAGH, HYDERABAD – 500 031

Department of Computer Science & Engineering

CYBER SECURITY
(PROFESSIONAL ELECTIVE-IV)

SYLLABUS FOR M.TECH (CSE) – III SEMESTER

L:T:P(Hrs./week):3:0:0	SEE Marks: 60	Course Code:**PI23PE314CS**
Credits: 3	CIE Marks : 40	Duration of SEE: 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** *On completion of the course, students will be able to*
1. Learn the fundamentals of Cyber Security 2. Gain understanding of relevant terminology, concepts in Cyber Security.	1. Understand Cyber Security Fundamentals 2. Gain knowledge about attacker techniques and motivation 3. Gain knowledge about exploitations used by the attackers 4. Understand the various kinds of malicious codes. 5. Gain knowledge about defense and analysis techniques.

UNIT-I

Cyber Security Fundamentals:

Network and Security Concepts – Information Assurance Fundamentals, Basic Cryptography, Symmetric Encryption, Public Key Encryption, The DNS, Firewalls.

OS Security Concepts, Microsoft Windows Security Principles – Window Tokens, Window Messaging, Windows Program Execution, The Windows Firewall.

Digital certificates – Concept and implementation details.

UNIT-II:

Attacker Techniques and Motivations:

Usage of Proxies by Attackers, Tunneling techniques.

Fraud Techniques – Phishing, Smishing, Vishing, Mobile malicious code, Rogue antivirus, Click fraud and Ransomware.
Threat Infrastructure – Botnets, Fast-Flux, Advanced Fast-Flux.

UNIT-III:
Exploitation:
Techniques to gain a foothold- Shell code, Integer overflow vulnerabilities, Stack based buffer overflow, Format string vulnerabilities, SQL injection, Malicious PDF files, Race conditions, Web exploit tools, Dos Conditions, Brute Force and dictionary attacks.
Misdirection, Reconnaissance, and Disruption Methods – Cross site scripting, Social Engineering, WarXing, DNS Amplification attacks

UNIT IV:
Malicious Code:
Self-replicating malicious code – worms and viruses.
Evading detection and Elevating Privileges – Obfuscation, VM Obfuscation, Persistent software techniques, Rootkits, Spyware, Attacks against privileged user accounts and escalation of privileges, token kidnapping, VM detection.
Stealing information and exploitation – Form grabbing, Man-in-the-middle attacks, DLL injections, Browser Helper objects.

UNIT V:
Defense and Analysis techniques:
Memory Forensics – Importance and capabilities of memory forensics, Memory analysis frameworks, Dumping physical memory, Installing and using volatality, Finding hidden processes, Volatality Analyst Pack.
Honeypots, Malicious code naming, Automated Malicious Code Analysis Systems: Passive Analysis, Active Analysis.
Intrusion Detection Systems

Learning Resources:

1. James Graham, Richard Howard, Ryan Olson, "Cyber Security Essentials", CRC Press, 2016.
2. Nina Godbole and Sunit Belapure, "Cyber Security", Wiley India, 2012.

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5

Duration of Internal Tests : 90 Minutes

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Department of Computer Science & Engineering

CLOUD COMPUTING
(PROFESSIONAL ELECTIVE-V)

SYLLABUS FOR M.TECH. (CSE) – III SEMESTER

L:T:P (Hrs./week): 3:0:0	SEE Marks:60	Course Code: **PI23PE324CS**
Credits: 3	CIE Marks : 40	Duration of SEE: 3 Hours

Course Objectives	**Course Outcomes**
	At the end of the course, Students will be able to
1. Evaluate the deployment and service models, understand the security issues and apply the concepts in practice to design a cloud solution.	1. Relate the evolution of hardware & software which substantiated the need and rise for cloud computing and its service offerings 2. Apply deployment approaches and prototype a cloud computing system 3. Analyze the need for virtualization in a cloud environment and apply it across compute and storage levels 4. Analyze the security issues across SPI infrastructure and evaluate the role of IAM and Privacy in cloud 5. Explain the standards in cloud computing & showcase the cloud service providers strategy in providing cloud computing

UNIT-I

The Evolution of Cloud Computing: Hardware Evolution, Internet Software Evolution, Establishing a common Protocol for the Internet, Evolution of Ipv6, Cloud Formation-From One Computer to a Grid of Many, Server Virtualization, Parallel Processing, Vector Processing, Symmetric Multiprocessing Systems, Massively Parallel Processing Systems.

Web Services and the Cloud: Communication-as-a Service (CaaS), Infrastructure-as-a-Service (IaaS), Monitoring-as-a-Service (MaaS), Platform-as-a-Service (PaaS), Software-as-a-Service(SaaS).

UNIT-II

Cloud Deployment Models: Public, Private, Hybrid Community.

Building Cloud Networks: The Evolution from the MSP Model to Cloud, Computing and Software- as-a-Service, The Cloud Data Centre, Collaboration, Service-Oriented Architectures as a Step Towards Cloud Computing, Basic Approach to a Data Centre-Based SOA The Role of Open Source Software in Data Centers, Where Open Source Software is Used.

UNIT-III

Virtualization: Introduction, types and technologies, accomplishing virtualization, Levels of virtualization, importance of virtualization in Cloud computing. Virtualization at the infrastructure level, CPU Virtualization, Virtualization in a Multicore processor, Storage Virtualization

Case studies: Xen Virtual machine monitor – Xen API, VMware – VMware products

Scaling in Cloud Computing and Scalable applications, Federation in the Cloud, Presence in the Cloud, Privacy and Its Relation to Cloud-Based Information System.

UNIT-IV

Security Issues in Cloud Computing: Infrastructure Security, Data Security and Storage, Identity and Access Management, Trust Boundaries and IAM, IAM Challenges, Relevant IAM Standards and Protocols for Cloud Services, IAM Practices in the Cloud, Cloud Authorization Management

Privacy Issues : Privacy Issues, Data Life Cycle, Key Privacy Concerns in the Cloud, Protecting Privacy, Changes to Privacy Risk Management and Compliance in Relation to Cloud Computing, Legal and Regulatory Implications

UNIT-V

Audit and Compliance

Internal Policy Compliance, Governance, Risk, and Compliance (GRC)

Common Standards in Cloud Computing: The Open Cloud Consortium, The Distributed Management Task Force, Standards for Application Developers, Standards for Messaging, Internet Messaging Access Protocol (IMAP), Standard for Security

Case study of CSP's: AWS, Google Cloud, Microsoft Azure, Salesforce

Learning Resources:

1. John W. Rittinghouse, James F. Ransome, Cloud Computing: Implementation, Management and Security, CRC Press Special

Indian edition, 2009, CRC Press, New Delhi.
2. Kai Hwang, Geoffrey C. Fox, Jack J. Dongarra,Distributed and Cloud Computing From Parallel Processing to the Internet of Things, 2012, Morgan Kaufmann, Elsevier
3. Tim Mather, Subra Kumaraswamy, Shahed Latif, Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance, 1st Edition, 2009, O'Reilly.
4. Ivanka Menken, Cloud computing Specialist Certification Kit virtualization, 2nd Edition, 2010, Emereo Pty Limited, New Delhi.
5. William Von Hagen, Professional Xen Virtualization, Wrox, 2008,Wiley Publications, New Delhi.
6. David Marshall, Wade A. Reynolds, Dave McCrory Advanced Server Virtualization: VMware and Microsoft Platforms in the virtual Data Center, Auerbach Publications, 2006, New Delhi.
7. https://aws.amazon.com/ec2/
8. https://cloud.google.com/appengine

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5

Duration of Internal Tests : 1 Hour 30 Minutes

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VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
SCHEME OF INSTRUCTION AND EXAMINATION (R-23)
M.TECH. – CSE : FOURTH SEMESTER AY 2024 - 2025

M.TECH (CSE) IV Semester								
Course Code	Name of the Course	Scheme of Instruction			Scheme of Examination			
		Hours per Week			Duration in Hrs	Maximum Marks		Credits
		L	T	P		SEE	CIE	
PRACTICALS								
PI23PW419CS	Dissertation – Phase II	-	-	32	-	Viva – voce (Grade)		16
	TOTAL	**-**	**-**	**32**				**16**
	GRAND TOTAL	**32**						

List of Professional Electives - Stream wise						
	AI and Data Engineering		**Systems & Networks**		**Applications**	
	Course Code	**Title**	**Course Code**	**Title**	**Course Code**	**Title**
PE-IV	PI23PE310CS	Machine Learning	PI23PE314CS	**Cyber Security**	PI23PE315CS	Image Processing
PE-V	PI23PE320CS	Information Retrieval systems	PI23PE324CS	**Cloud Computing**	PI23PE325CS	Multimedia Technologies

Semester	**Actual credits**
III Semester	16
IV Semester	16
Total credits	**32**

Audit courses and Open Electives		
S.No.	**Course Code**	**Course Title**
Audit Course – I		
1	PI23AC110EH	English for Research Paper Writing
2	PI23AC120XX	Value Education
3	PI23AC130XX	Stress Management by Yoga
4	PI23AC140XX	Sanskrit for Technical Knowledge
Audit Course –II		
1	PI23AC210EH	Pedagogy Studies
2	PI23AC220XX	Personality Development through Life Enlightenment Skills.
3	PI23AC230XX	Constitution of India
4	PI23AC240XX	Disaster Management
Open Electives		
1	PI23OE310XX	Business Analytics
2	PI23OE320XX	Industrial Safety
3	PI23OE330XX	Operations Research
4	PI23OE340XX	Cost Management of Engineering Projects
5	PI23OE350XX	Composite Materials
6	PI23OE360XX	Waste to Energy

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